

DILOG

Model DQ214

SMD INTERFACE DISC CONTROLLER

LSI-11 COMPATIBLE

FEATURES

- Interfaces LSI-11, 11/2, 11/23 and 11/23 PLUS computers to any two SMD compatible disc drives.
- Maintains compatibility with RL01/RL02 software drivers under RT-11, RSX-11 and RSTS operating systems.
- Two megawords access using 22-bit memory addressing.
- DILOG Universal Formatting System.
- 56-bit ECC for error detection and correction.
- Up to 88% utilization of unformatted storage capacity.
- Completely contained on one QUAD PCB.
- Up to 60% less power consumption than other similar controllers.
- Full sector data buffering.
- On-board bootstrap loader.
- Automatic self test with LED status indicator.

DESCRIPTION

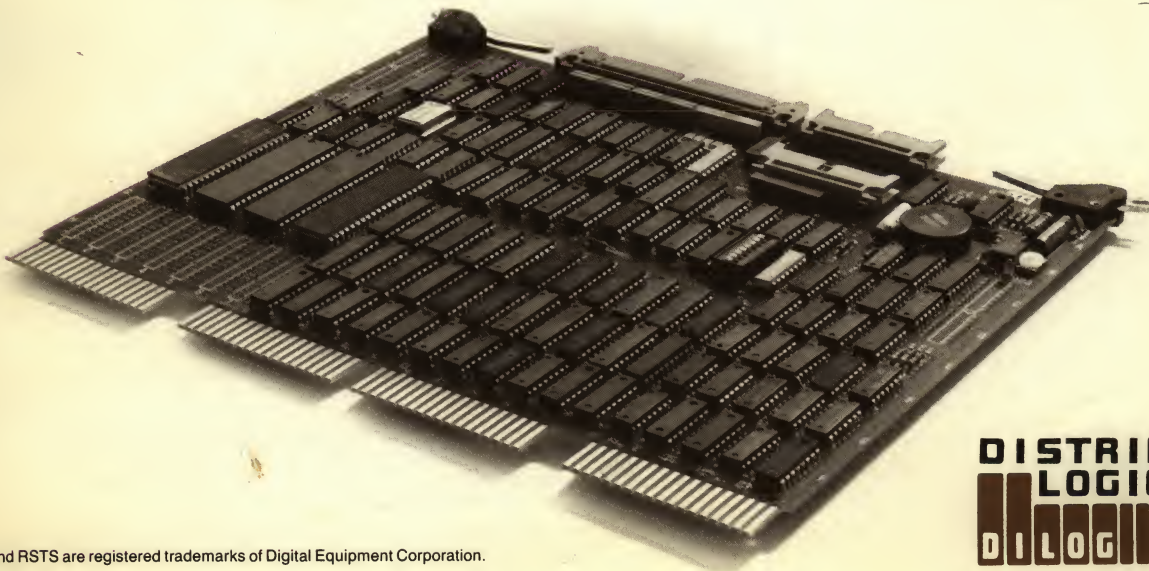
The Distributed Logic Corporation (DILOG) Model DQ214 Disc Controller with Universal Formatting allows the user to mix-or-match two different drives without changing the controller or components on the controller. The drives may be 8" and/or 14" Winchester, SMD pack or cartridge type. If a drive is changed or added, the operator simply identifies the drive and emulation from a terminal, and the controller formats the disc.

Data errors are corrected or compensated for in several ways. During formatting, the controller assigns alternate tracks if a media flaw is detected. During read operations, read-retries are performed for soft errors caused by marginal drive conditions. In addition, a 56-bit error correction code is used for detecting or correcting data errors of up to 11 consecutive bits.

Twenty-two bits of memory addressing permit accessing of two megawords. The controller supports the LSI-11 scheme of four levels of interrupt.

A complete disc subsystem is comprised of the controller, one or two disc drives, and the necessary interconnecting ribbon cables.

No specially wired connectors, additional chassis, power supplies or bus converters are required. The quad printed circuit module contains all necessary interface and formatting circuitry.



DISC DRIVE COMPATIBILITY

The Model DQ214 can interface with up to two SMD-I/O compatible drives having up to 50 megabytes of unformatted capacity each. Two drives with the same or different characteristics and/or types (Winchester, SMD pack, or CMD cartridge) may be handled by the same controller. This includes mixing 8" or 14" Winchester, SMD pack, or CMD cartridge type drives.

MEDIA FLAW COMPENSATION

Incorporated in the DQ214 are three features used to compensate for data errors whether they are caused by media flaws, minor drive misalignment or weak components in the drive (i.e. soft servo system). First, the DQ214 flags bad sectors on the disc and assigns alternate tracks when formatting. Second, an automatic read-retry is incorporated once the pack is formatted. Read-retries will compensate for soft errors that can occur due to marginal drive components. These features are transparent to the RT-11, RSX-11 & RSTS operation systems. Third, a 56-bit ECC polynomial is used for detecting and correcting data errors up to 11 bits in length. With this polynomial the chances of misdetecting and/or miscorrecting single or double burst errors are greatly reduced when compared with the commonly used 32-bit polynomial. Switch selection of software or hardware correction is implemented on the controller. The DQ214 is compatible with the software correction facility utilized in the DEC operating systems.

HARDWARE BOOTSTRAP

The Model DQ214 contains an on-board bootstrap loader for RP02/RP03, RK06/RK07, RX02, RK05, RL01/RL02 and TM-11 mag tape support. On-board jumpers allow selectable bootstrap addresses, in addition to enabling/disabling the bootstrap. When the bootstrap is disabled, the Model DQ214 will boot from the standard DEC REV-11 Module.

SOFTWARE SUPPORT

The Model DQ214 is transparent to the RL01/RL02 drivers contained in the various DEC operating systems, such as RT-11, RSX-11 and RSTS. A format/diagnostic routine is supplied with each unit.

DATA FORMAT MAPPING

The Model DQ214 allows the various types of physical drives with which it is compatible to be mapped into a maximum of 8 logical units. The controller contains switches for the selection of RL01 or RL02 emulation for each logical unit to maximize the capacity of various disc drives.

MICROPROCESSOR BASED

The heart of the Model DQ214 is a high speed, bipolar microprocessor configuration. The majority of controller functions are implemented in firmware. This allows a parts count significantly reduced from conventional controllers. User benefits include reduced size, increased controller reliability and applications flexibility.

AUTOMATIC SELF-TEST

The Model DQ214 is supplied with an automatic self-test feature which causes on-board microdiagnostics to be run on the controller each time the Q-Bus is initialized. A green card-edge LED indicator is lit and remains lit after each successful completion of the microdiagnostics. Should the microdiagnostics fail, the LED indicator is extinguished and a data protect feature is invoked which disallows any communications between the CPU and the disk, thus protecting critical data base areas from the overwriting of erroneous information.

MODE CONTROL SWITCHES

Model DQ214 contains on-board jumpers and switches for selection of starting bootstrap address, bootstrap enable/disable, disc mapping control, device address selection and hardware or software selection of ECC data error correction.

LOW POWER CONSUMPTION

With its single board architecture and extensive use of Low Power Schottky circuitry, the Model DQ214 exhibits up to 60% less power consumption than other DEC compatible SMD type disc controllers.

FULL SYSTEM SUPPORT

Distributed Logic Corporation also supplies fully integrated and tested disc subsystems including the disc drives themselves. For the customer who wishes to purchase drives directly from the manufacturer, they can be drop-shipped to DILOG where they will be integrated, tested, and shipped as a complete system with the Model DQ214.

DOCUMENTATION

Each Model DQ214 is supplied with an Instruction Manual.

OPTIONS

Disk drive I/O cables • Disc Drives • Factory integration of customer supplied drives.

DISC DRIVES SUPPORTED

The Model DQ214 will interface to industry standard SMD I/O compatible disc drives including manufacturers and drive types as follows:

CDC—SMD/CMD/MMD/LARK
CENTURY DATA—TRIDENT SMD—MARKSMAN
BALL COMPUTER PRODUCTS—SMD
AMPEX—SMD/WINCHESTER/DFR
FUJITSU—WINCHESTER
KENNEDY—WINCHESTER
PRIAM—WINCHESTER
BASF—WINCHESTER
MEMOREX—WINCHESTER
SLI INDUSTRIES

Rotational Rates—to 3,600 rpm

Unformatted Capacities—to 50 megabytes

CONTROLLER SPECIFICATIONS

Mechanical—The Model DQ214 is completely contained on one quad module 10.44 inches wide by 8.88 inches deep and plugs into and requires one slot in any DEC LSI-11 based backplane.

Computer I/O

Register Addresses (PROM selectable)

- Control Status (RLCS) 774 400
- Current Bus Address (RLBA) 774 402
- Disk Address (RLDA) 774 404
- Multipurpose (RLMP) 774 406

Data Transfer

- Method: DMA
- Maximum block size transferred in a single operation is 10K words.

Bus Load

- 1 std unit load

Address Ranges

- Disc drive: up to 50 megabytes total
- Computer memory: to 2 megawords

Interrupt Vector Address

- PROM selectable (factory set at 210, priority level BR5)

Disc Drive I/O

Connector—One 60 pin type "A" flat ribbon cable connector mounted on outer edge of controller module. Two 26 pin type "B" ribbon cable (1 for each drive interfaced with).

Signal—SMD A/B flat cable compatible

Power—+ 5 volts at 3.5 amps, + 12 volts at 300 milliamps from computer power supply.

Environment—Operating temperature 40°F. to 140°F., humidity 10 to 95% non-condensing.

Shipping Weight—5 pounds, includes documentation and cables.

†Specifications subject to change without notice.

**DISTRIBUTED
LOGIC CORP.**
DILOG

electronics
international bv
adm. bankertweg 22, postbus 443, 2300 AK leiden,
nederland, telefoon 071-14 60 45*, telex 39420